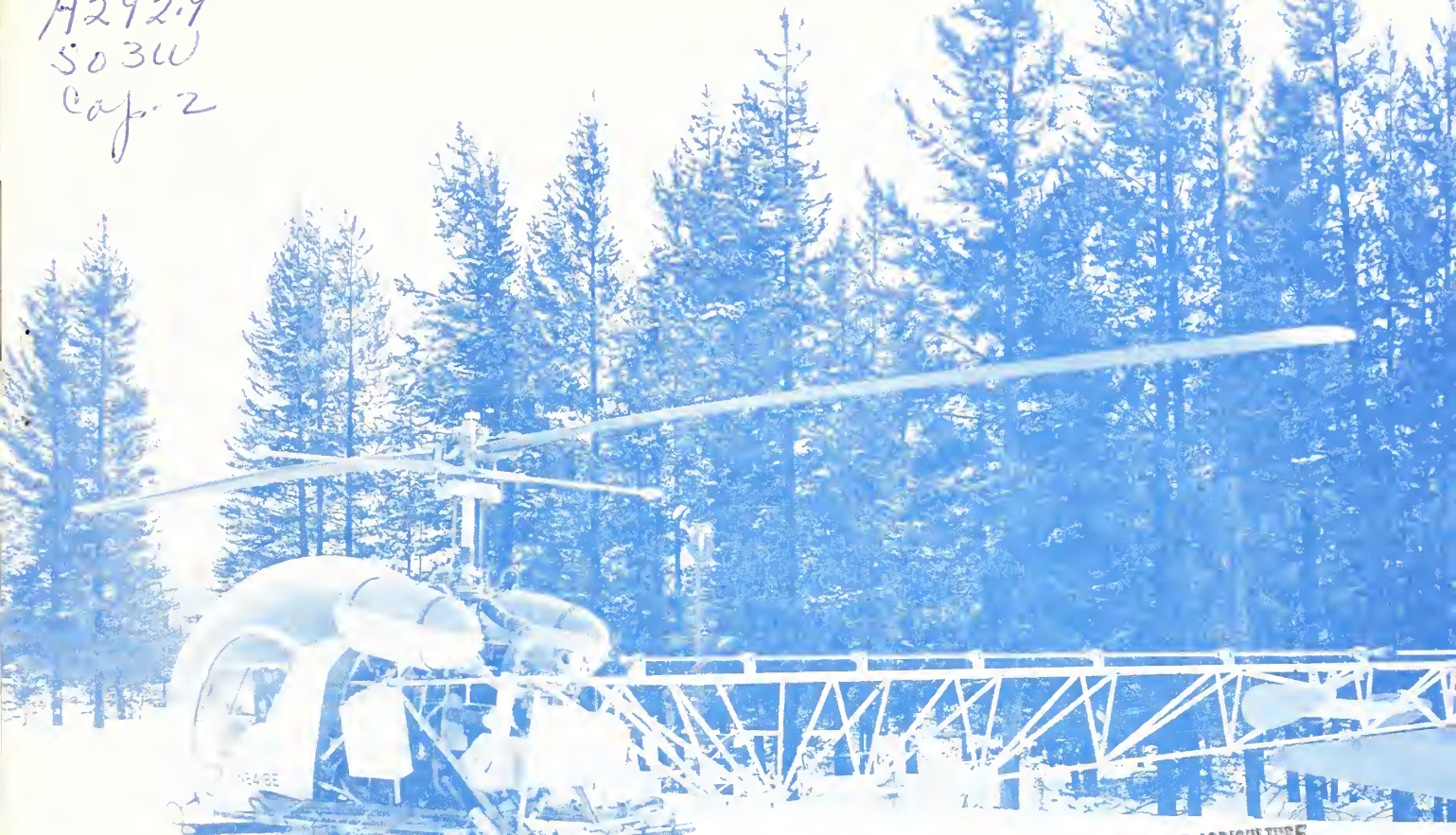


WATER SUPPLY OUTLOOK
and
FEDERAL - STATE - PRIVATE COOPERATIVE SNOW SURVEYS
for
WESTERN UNITED STATES
Including Columbia River Drainage in Canada

UNITED STATES DEPARTMENT of AGRICULTURE···SOIL CONSERVATION SERVICE
Collaborating with
CALIFORNIA DEPARTMENT of WATER RESOURCES
and
BRITISH COLUMBIA DEPARTMENT of
LANDS, FORESTS and WATER RESOURCES

AS OF
APR. 1, 1965

UNITED STATES DEPARTMENT OF AGRICULTURE - SOIL CONSERVATION SERVICE

To Recipients of Water Supply Outlook Reports:

The climate of the cultivated and populated areas of the West is characterized by relatively dry summer months. Such precipitation as occurs falls mostly in the winter and early spring months when it is of little immediate benefit to growing crops. Most of this precipitation falls as mountain snow which stays on the ground for months, melting later to sustain streamflow during the period of greatest demand during late spring and summer. Thus, nature provides in mountain snow an imposing water storage facility.

The amount of water stored in mountain snow varies from place to place as well as from year to year and accordingly, so does the runoff of the streams. The best seasonal management of variable western water supplies results from advance estimates of the streamflow.

A snow survey consists of a series of about ten samples taken with specially designed snow sampling equipment along a permanently marked line, up to 1000 feet in length, called a snow course. The use of snow sampling equipment provides snow depth and water equivalent values for each sampling point. The average of these values is reported as the snow survey measurement for a snow course.

Snow surveys are made monthly or semi-monthly beginning in January or February and continue through the snow season until April, May or June. Currently more than 1400 western snow courses are measured each year. These measurements furnish the key data for water supply forecasts.

Streamflow forecasts are obtained by a comparison of total or maximum snow accumulation, as measured by snow water equivalent, to the subsequent spring and summer or snowmelt season runoff over a period of years. The snow water equivalent measured in selected snow courses provides most of the index to the streamflow forecast for the following season. More accurate forecasts are usually obtained when other factors such as soil moisture, base flow and spring precipitation are considered and included in the forecast procedure. Early season forecasts assume average climatic conditions through the snowmelt season.

Listed below are the Federal-State-Private Cooperative Snow Survey and Water Supply Forecast reports available for the West which contain detailed information on snow survey measurements, streamflow forecasts, reservoir storage, soil moisture and other guide data to water management and conservation decisions. Soil Conservation Service Reports may be secured from Soil Conservation Service, 511 N.W. Broadway - Room 507, Portland, Oregon 97209.

PUBLISHED BY SOIL CONSERVATION SERVICE

REPORTS	ISSUED	LOCATION	COOPERATING WITH
RIVER BASINS			
WESTERN UNITED STATES	MONTHLY (FEB.-MAY)	PORTLAND, OREGON	ALL COOPERATORS
BASIC DATA SUMMARY	OCTOBER 1	PORTLAND, OREGON	ALL COOPERATORS
STATES			
ALASKA	MONTHLY (MAR.-MAY)	PALMER, ALASKA	ALASKA S.C.D.
ARIZONA	SEMI-MONTHLY (JAN. 15 - APR. 1)	PHOENIX, ARIZONA	SALT R. VALLEY WATER USERS ASSOC. ARIZ. AGR. EXP. STATION
COLORADO AND NEW MEXICO	MONTHLY (FEB.-MAY)	FORT COLLINS, COLORADO	COLO. STATE UNIVERSITY COLO. STATE ENGINEER N. MEX. STATE ENGINEER
IDAHO	MONTHLY (JAN.-JUNE)	BOISE, IDAHO	IDAHO STATE RECLAMATION ENGINEER
MONTANA	MONTHLY (JAN.-JUNE)	BOZEMAN, MONTANA	MONT. AGR. EXP. STATION
NEVADA	MONTHLY (JAN.-MAY)	RENO, NEVADA	NEVADA DEPT. OF CONSERVATION AND NATURAL RESOURCES DIVISION OF WATER RESOURCES
OREGON	MONTHLY (JAN.-JUNE)	PORTLAND, OREGON	OREG. STATE UNIVERSITY OREGON STATE ENGINEER
UTAH	MONTHLY (JAN.-JUNE)	SALT LAKE CITY, UTAH	UTAH STATE ENGINEER
WASHINGTON	MONTHLY (FEB.-JUNE)	SPOKANE, WASHINGTON	WN. STATE DEPT. OF CONSERVATION
WYOMING	MONTHLY (FEB.-JUNE)	CASPER, WYOMING	WYOMING STATE ENGINEER

PUBLISHED BY OTHER AGENCIES

REPORTS	ISSUED	AGENCY
BRITISH COLUMBIA	MONTHLY (FEB.-JUNE)	WATER RESOURCES SERVICE, DEPT. OF LANDS, FOREST AND WATER RESOURCES, PARLIAMENT BLDG., VICTORIA, B.C., CANADA
CALIFORNIA	MONTHLY (FEB.-MAY)	CALIF. DEPT. OF WATER RESOURCES, P.O. BOX 388, SACRAMENTO, CALIF.

PORTLAND, OREGON 964

WATER SUPPLY OUTLOOK
and
FEDERAL - STATE - PRIVATE COOPERATIVE SNOW SURVEYS
for
WESTERN UNITED STATES
Including Columbia River Drainage in Canada

ISSUED

APRIL 1, 1965

The Soil Conservation Service coordinates snow surveys conducted by its staff and many cooperators, including the Bureau of Reclamation, Corps of Engineers, Forest Service, National Park Service, Geological Survey, and other Federal Agencies, Departments of State Government, Irrigation Districts, Power Companies, and others.

The Department of Water Resources coordinates snow surveys in California.

The Water Resources Service, Department of Lands, Forests, and Water Resources directs snow surveys in British Columbia.

This report was prepared by the Water Supply Forecasting Branch, Engineering Division, Soil Conservation Service, from data supplied by Snow Survey Supervisors of the Soil Conservation Service in the States of Arizona, Colorado and New Mexico, Idaho, Montana, Nevada, Oregon, Utah, Washington and Wyoming.

Data from California was supplied by the Chief, Water Supply Forecast and Snow Surveys Unit, Department of Water Resources.

Data from British Columbia was supplied by the Chief, Hydrology Division, Water Investigations Branch, Department of Lands, Forests and Water Resources.

U. S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE
D. A. WILLIAMS, ADMINISTRATOR

Seasonal flows will tend to exceed those of 1964, but peak flows comparable to those of last June are not anticipated. The floods on the northern Montana tributaries to the Missouri last year were principally the result of heavy June rains.

MONTANA

Snowpack at higher elevations is generally at a maximum of record for the past 25 years on the headwaters of the Missouri and Yellowstone. At lower elevations remaining snow cover trends toward average. Increases in snow cover have generally been above average for the past month. Snowpack is roughly 140 percent of average for April 1 and that of April 1 a year ago. Runoff on snow fed streams is expected to rank between the 2nd and 6th highest flows recorded in the past 30 years.

Late season supplies of irrigation water should be adequate because of the probable late melting of high elevation snow.

Reservoirs will probably be drawn down so that storage can be used to reduce peak flows. No major high water problems are anticipated with near average sequences of temperature and rainfall during the snowmelt period. However, heavy rain on a ripe and melting snowpack could result in serious flooding.

WYOMING

Water supply outlook is good for the entire Bighorn drainage, including areas east and west of the main river through the Powell Basin and along the upper Wind and Popo Agie. Streamflow will be in excess of average and storage is adequate.

Even with deficient storage on the North Platte streamflow total water supplies will be enough to meet demands along the North Platte in eastern Wyoming and western Nebraska. Storage in Seminoe and Pathfinder reservoirs will remain below average at the end of the season.

COLORADO

The South Platte and its tributaries should have above average flows this year in the range of 110 to 130 percent of average. With carryover storage and supplemental supplies from the Colorado-Big Thompson Project water supplies should be adequate. Valley soils, particularly along the lower South Platte are dry.

ARKANSAS BASIN

The water supply outlook for the Arkansas is the best for several years, even with a limited reservoir storage. Streamflow during the snowmelt season is forecast at 140 percent of average. Soil moisture conditions are poor with an extreme drouth during the winter months near and below Lamar.

Streamflow in the upper Canadian should be above average from snowmelt. Water supply outlook is only fair because of a series of drouth years and depletion of reservoir storage for the Tucumcari Project.

RIO GRANDE BASIN

The most favorable water supply since 1957 is in prospect for the Rio Grande and its tributaries in Colorado and New Mexico. Snowpack in the headwater mountains of Colorado and northern New Mexico is the highest since 1952 on this date. With several years of drouth, storage is at or near a record low in all reservoirs. Even with forecasts ranging near 150 to 175 percent of the 1948-62 average, more runoff would be welcome to overcome the water deficiencies resulting from years of below normal snowfall and valley precipitation.

COLORADO BASIN

The trend to above average streamflow for 1965 extends to the Colorado River in both the upper Basin and for Arizona. Highest snowpacks are on the San Juan in Colorado and the Green River in Wyoming. The forecast of Inflow to Lake Powell is 135 percent of average which exceeds the total of snowmelt season flow for 1963 and 1964. Flows will be similar to that for 1962. Overall storage on the Colorado River is slightly below average and less than half of total capacity but a little above a year ago on this date.

COLORADO

Winter snowfall has been above average west of the Continental Divide. Streamflow forecasts range from 120 to 160 percent of average for the April-September period. Water supplies will be adequate for local needs along the principal tributary streams. Mountain and valley soils tend to be wet.

UTAH

Snowfall on Colorado and Green River tributaries in Utah was less than average during February and March and substantial reductions in forecasts have been made since February 1. Forecasts now range from slightly below average on the Virgin and for streams in the LaSal Mountain area to near 130 percent of average for the Duchesne. Should late season precipitation be deficient there could be some shortages this summer in local areas of southern Utah.

SUMMARY OF SNOW WATER EQUIVALENT MEASUREMENTS APRIL 1, 1965

MAJOR BASIN AND SUB—WATERSHED	WATER EQUIVALENT IN PERCENT OF: LAST YEAR	AVERAGE
MISSOURI BASIN		
Jefferson	138	135
Madison	137	134
Gallatin	123	137
Missouri Main Stem	109	132
Yellowstone	129	144
Shoshone	126	126
Wind	130	129
North Platte	122	115
South Platte	176	118
ARKANSAS BASIN		
Arkansas	172	142
Canadian	145	150
RIO GRANDE BASIN		
Rio Grande (Colo.)	217	146
Rio Grande above Otowi Bridge	180	146
Pecos	189	256
COLORADO BASIN		
Green (Wyo.)	146	145
Yampa - White	157	122
Duchesne	180	111
Price	176	127
Upper Colorado	165	129
Gunnison	142	126
San Juan	208	132
Dolores	181	132
Virgin	153	91
Gila	249	108
Salt	171	128
GREAT BASIN		
Bear	136	125
Logan	148	133
Ogden	111	101
Weber	141	121
Provo - Utah Lake	158	120
Jordan	131	116
Sevier	153	90
Walker - Carson	203	125
Tahoe - Truckee	170	122
Humboldt	92	79
Lake Co. (Oregon)	58	63
Harney Basin (Oregon)	92	103
UPPER COLUMBIA BASIN		
Columbia (Canada)	87	95
Kootenai	111	107
Clark Fork	111	116
Bitterroot	111	118
Flathead	114	119
Spokane	95	107
Okanogan	89	99
Methow	89	83
Chelan	--	--
Wenatchee	84	101

MAJOR BASIN AND SUB—WATERSHED	WATER EQUIVALENT IN PERCENT OF: LAST YEAR	AVERAGE
SNAKE BASIN		
Snake above Jackson, Wyo.	137	120
Snake above Heise, Idaho	136	130
Snake above American Falls Res	130	133
Henry's Fork	129	130
Southern Idaho Tributaries	145	123
Big and Little Wood	177	162
Boise	164	135
Owyhee	79	98
Payette	146	123
Malheur	85	120
Weiser	130	125
Burnt	104	119
Powder	127	126
Salmon	154	140
Grande Ronde	115	126
Clearwater	98	115
LOWER COLUMBIA BASIN		
Yakima	83	93
Umatilla	69	104
John Day	121	119
Deschutes - Crooked	88	93
Hood	84	91
Willamette	69	79
Lewis	85	94
Cowlitz	92	89
PACIFIC COASTAL BASIN		
Puget Sound	76	98
Olympic Peninsula	68	73
Umpqua - Rogue	73	82
Klamath	72	80
Trinity	90	50
CALIFORNIA CENTRAL VALLEY		
Upper Sacramento	100	70
Feather	130	90
Yuba	130	105
American	170	110
Mokelumne	165	100
Stanislaus	180	100
Tuolumne	200	110
Merced	200	110
San Joaquin	200	100
Kings	220	100
Kaweah	165	100
Tule	135	80
Kern	280	85

Data for California Watersheds supplied by Dept. of Water Resources, and for British Columbia Watersheds by Dept. of Lands, Forests and Water Resources.

Average is for 1948-62 period.

Based on Selected Snow Courses determined by Distribution within the Basin, Length of Record and Repetitive Monthly Measurement Schedules.

SELECTED STREAMFLOW FORECASTS

APRIL-SEPTEMBER as of APRIL 1, 1965

STREAM AND STATION	1000 ACRE-FEET		PERCENT OF AVERAGE
	FLOW 1964	FORECAST 1965	
UPPER MISSOURI			
Clark Fork at Chance, Montana	602	690	118
Gallatin near Gateway, Montana	551	565	126
Jefferson at Sappington, Montana	1294	1300	133
Madison near Grayling, Montana 1/	474	509	121
Missouri near Zortman, Montana 2/	6697	6000	133
Missouri near Williston, N. Dakota 3/	13999	15300	138
Yellowstone at Corwin Springs, Montana	2128	2273	121
Yellowstone at Miles City, Montana		7830	135
Shoshone below Buffalo Bill Res., Wyoming 4/		960	119
Wind at Dubois, Wyoming		136	136
PLATTE			
Clear at Golden, Colorado	88	185	138
North Platte at Saratoga, Wyoming		768	119
Cache LaPoudre near Ft. Collins, Colorado 6/		290	118
ARKANSAS			
Arkansas at Salida, Colorado 7/	293	470	140
RIO GRANDE			
Rio Grande near Del Norte, Colorado 8/	316	740	150
Rio Grande at Otowi Bridge, New Mexico 9/		1100	181
Pecos at Pecos, New Mexico *		80	150
UPPER COLORADO			
Animas at Durango, Colorado		580	127
Colorado at Glenwood Springs, Colorado 10/		2050	132
Colorado near Cisco, Utah	2525	5700	150
Colorado, Inflow to Lake Powell, Arizona 11/**	5483	10700	135
Duchesne near Tabiona, Utah 12/		146	127
Green, Inflow to Flaming Gorge Res., Utah**	1180	1380	123
Green near Green River, Utah 13/	2875	4250	126
Gunnison near Grand Junction, Colorado		1800	138
Price near Scofield, Utah 14/	33	46	124
San Juan near Bluff, Utah 15/	644	1775	151
White at Meeker, Colorado		410	124
Yampa at Steamboat Springs, Colorado		385	132
LOWER COLORADO			
Gila near Soloman, Arizona (Apr-May)	11	32	82
Salt at Intake, Arizona (Apr-May)	80	210	146
Verde above Horseshoe Dam, Arizona (Apr-May)	71	72	150
GREAT BASIN			
Bear at Harer, Idaho 16/	289	430	167
Logan near Logan, Utah 17/	123	190	143
Ogden, Inflow to Pine View Res., Utah 18/ (Mar.-July)	115	132	115
Provo at Vivian Park, Utah 19/		175	122
Sevier at Hatch, Utah 20/	35	37	82
Sevier near Kingston, Utah	12	16	64
Humboldt at Palisades, Nevada **	271	200	115
Truckee at Farad, California ** 21/	180	320	119
West Walker near Coleville, California **	86	200	143

Forecasts in California provided by Department of Water Resources.
Average is for 1948-62 period except California. California is computed for 1908-57 period.
Forecasts assume average Effective Climatic Conditions from Date Through Snow Melt Season.

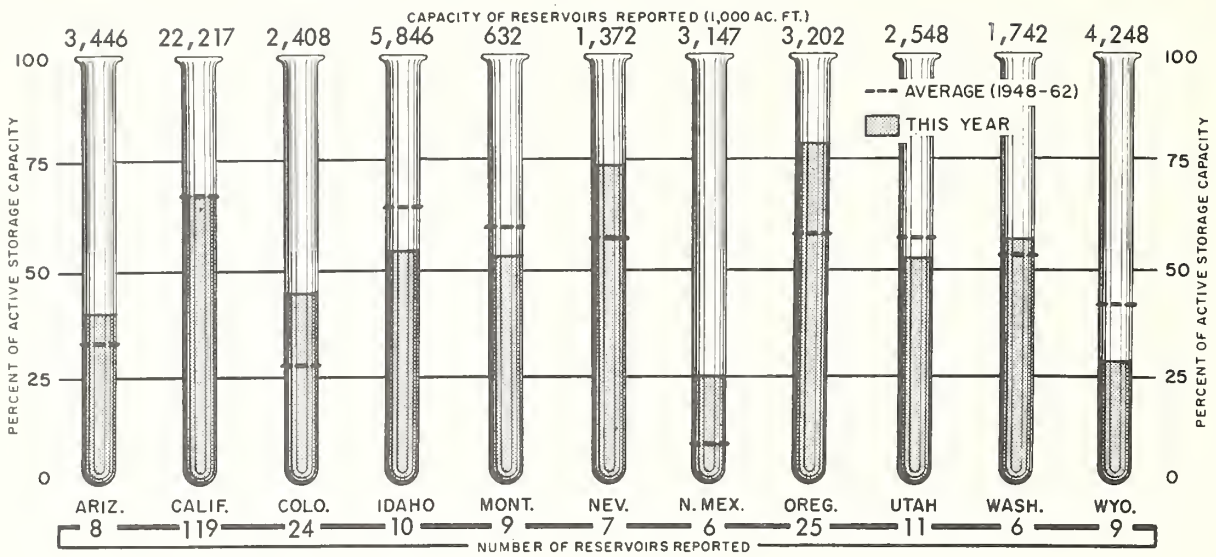
SELECTED STREAMFLOW FORECASTS

APRIL-SEPTEMBER as of APRIL 1, 1965

STREAM AND STATION	1000 ACRE-FEET		PERCENT OF AVERAGE
	FLOW 1964	FORECAST 1965	
UPPER COLUMBIA			
Bitterroot near Darby, Montana	730	745	128
Chelan at Chelan, Washington 22/		1340	99
Clark Fork above Missoula, Montana	2130	2380	130
Clark Fork at Whitehorse Rapids, Montana 23/	15512	17400	121
Columbia at Revelstoke, British Columbia	20880	20900	105
Columbia at Birchbank, British Columbia 24/	45222	44000	100
Columbia at Grand Coulee, Washington 24/	70253	72300	103
Columbia at The Dalles, Oregon 24/	108696	121000	111
Flathead near Polson, Montana 23/	8553	9250	119
Kootenai at Wardner, British Columbia	4728	5400	110
Kootenai at Leonia, Idaho	9037	9600	104
Okanogan near Tonasket, Washington		1940	99
Spokane at Post Falls, Idaho 25/	3836	3650	107
SNAKE			
Big Lost, Inflow to Mackay Res., Idaho 26/	169	270	184
Big Wood, Inflow to Magic Res., Idaho 27/	245	460	174
Boise above Diversion Dam, Idaho 28/	1564	2400	147
Clearwater at Spalding, Idaho	10920	10900	118
Malheur near Drewsey, Oregon		90	110
Owyhee Res. Net Inflow, Oregon 18/	523	400	105
Payette near Horseshoe Bend, Idaho 29/	1757	2600	131
Salmon at Whitebird, Idaho	7438	9750	140
Snake near Heise, Idaho 30/	4634	4800	124
Snake at Weiser, Idaho		8600	124
LOWER COLUMBIA			
Cowlitz at Castle Rock, Washington		2730	92
Deschutes at Benham Falls, Oregon 31/		662	105
Grande Ronde near LaGrande, Oregon	155	231	114
Hood near Hood River, Oregon 32/	322	355	93
Willamette at Salem, Oregon 33/		5010	90
Yakima near Parker, Washington 34/		1940	96
NORTH PACIFIC COASTAL			
Dungeness near Sequin, Washington		161	90
Rogue at Raygold near Central Point, Oregon	980	950	95
Klamath Lake, Net Inflow, Oregon 35/	505	770	120
CALIFORNIA CENTRAL VALLEY 36/**			
American, Inflow to Folsom Res., Calif.	912	1440	104
Feather near Oroville, Calif.	1165	1700	88
Kaweah near Three Rivers, Calif. 37/	163	250	95
Kern near Bakersfield, Calif.	183	360	83
Kings, Inflow to Pine Flat Res., Calif.	615	1100	94
Merced, Inflow to Exchequer Res., Calif.	310	610	98
Mokelumne, Inflow to Pardee Res., Calif.	309	555	116
Sacramento, Inflow to Shasta Res., Calif.	1183	1640	92
San Joaquin, Inflow to Friant Res., Calif.	643	1150	95
Stanislaus, Inflow to Melones Res., Calif.	432	790	107
Tule, Inflow to Success Res., Calif.	33	40	71
Tuolumne, Inflow to Don Pedro Res., Calif.	743	1260	104
Yuba at Smartville, Calif.	767	920	82

Explanatory Notes on Forecasts Listed on Inside Back Cover.
** April - June Period ** April - July Period*

RESERVOIR STORAGE as of April 1



ARIZONA

Water supply outlook for Arizona is good. Snow cover remaining on April 1 is above average on all watersheds except the Verde. Recent warm storms melted most of the snow on the Verde providing a high runoff in March. Reservoir storage is well above average at this time in the Salt River Project reservoirs but below average on the Gila. Total flow of the Salt, Verde and Tonto is forecast to flow 139 percent of average for April and May. Mountain soil moisture conditions are excellent.

GREAT BASIN

UTAH

Water supply outlook for southern Utah is fair to good while in central and northern areas streamflow is expected to be more than adequate in 1965. There is a variation among individual streams but forecasts of 80 to 90 percent of average are common west of the Colorado-Great Basin Divide in southern Utah, near average for the tributaries to Utah Lake and in the immediate vicinity of Salt Lake City, and 125 to 140 percent of average on the Bear River and its tributaries.

Minor high water damage can be expected in northern Utah, especially on streams with limited or no storage. The extent of such damage will depend largely on late season snowfall and temperature sequences during the snowmelt period.

NEVADA

Nevada water supply outlook for irrigation, power, municipal, and other uses remains most favorable. Although February and March snowfall was below average these deficiencies have been offset by the heavy snowpack which accumulated during December and January. April-July 1965 streamflow forecasts range from 94 percent of average on the Owyhee to 158 percent on some east slope of Sierra streams. Forecasts have been lowered moderately from a month ago due to the deficient March precipitation.

Mountain soils in northern and western Nevada are wet. Reservoir storage is excellent at 129 percent of the April 1 average and 73 percent of capacity. Considerable reservoir stored water will be carried over into the 1966 water year.

COLUMBIA BASIN

The United States section of the Columbia Basin along with adjacent areas in Oregon, California and Nevada had extremely heavy precipitation during December and January. In the warmer areas near the coast much of the precipitation was rainfall which did not add materially to the snowpack. Rather, this rainfall caused heavy runoff and general flooding. In the higher and colder areas of the basin the precipitation fell as snow leaving heavy snowpacks in western Wyoming and Montana, southern Idaho and eastern Oregon. During February and March snowfall in the upper basin in both United States and Canada continued near average. Snowfall in the Cascade Mountains of Oregon and Washington has been extremely low during this last two-month period.

Therefore streamflow may be expected to be very high in central Idaho and adjacent areas. High water problems are to be expected where reservoir storage is not available to help control snowmelt peaks.

STORAGE IN LARGE RESERVOIRS APRIL 1, 1965

BASIN AND NAME OF RESERVOIR	CAPACITY (1000 A.F.)	STORAGE (1000 A.F.)
UPPER MISSOURI		
Boysen	560	241
Buffalo Bill	380	111
Canyon Ferry	2043	1643
Hebgen	385	224
Tiber	1316	692
Belle Fourche	185	153
Keyhole	190	125
Fort Peck	19105	15245
Fort Randall	6100	4155
Garrison	24500	12853
Oahe	23600	10850
PLATTE		
Glendo	786	386
Pathfinder	1011	145
Seminoe	982	91
Colo-Big Thompson (4)	865	295
ARKANSAS		
Conchas	280	3
John Martin	367	4
RIO GRANDE		
Elephant Butte	2207	147
El Vado	194	3
UPPER COLORADO		
Flaming Gorge	3789	669
Navajo	1709	254
Powell	28040	6222
LOWER COLORADO		
Havusu	619	534
Mead	27209	11151
Mohave	1810	1663
San Carlos	1206	77
Salt River Res. (4)	1755	950
Verde River Res. (2)	322	173
GREAT BASIN		
Bear	1421	948
Lahontan	286	236
Rye Patch	179	159
Sevier Bridge	236	60
Strawberry	270	67
Tahoe	732	497
Utah	1149	492

BASIN AND NAME OF RESERVOIR	CAPACITY (1000 A.F.)	STORAGE (1000 A.F.)
UPPER COLUMBIA		
Chelan	676	288
Coeur d'Alene	238	119
Flathead	1791	958
Hungry Horse	2982	1567
Kootenay	673	138
Pend Oreille	1155	836
Roosevelt	5232	2679
LOWER COLUMBIA		
Detroit	300	162
Hills Creek	249	102
Lookout Point	337	137
Yakima Res. (5)	1066	816
SNAKE		
American Falls	1700	1453
Arrowrock	287	100
Anderson Ranch	423	185
Brownlee	1427	491
Cascade	653	183
Jackson	847	479
Lucky Peak	278	14
Palisades	1202	395
Owyhee	715	638
PACIFIC COASTAL		
Clear Lake	440	290
Upper Klamath	584	391
Ross	1203	817
Trinity	2500	2175
CALIFORNIA CENTRAL VALLEY		
Almanor	1036	807
Berryessa	1602	1599
Cachuma	205	135
Casitas	254	43
Cherry Valley	268	97
Don Pedro	290	200
Folsom	1010	533
Hetch-Hetchy	360	157
Isabella	570	117
McClure	281	165
Millerton	521	271
Nacimiento	350	184
Pardee	210	183
Pine Flat	1013	503
Shasta	4500	3561

Reservoir Storage Data Provided by Bureau of Reclamation, Corps of Engineers, Geological Survey, and water using organizations. Data from California and British Columbia provided by Department of Water Resources and Department of Lands, Forests and Water Resources, respectively.

The forecast of the Columbia at The Dalles is 121,000,000 acre-feet for the April-September 1965 period as compared to about 108,000,000 in 1964 and 131,000,000 in the last high runoff year of 1956. Much of the excess flow will come from the Snake River watershed in Idaho and the Clark Fork in Montana.

BRITISH COLUMBIA

The Water Resources Service reports that April 1 snow surveys and resulting quantitative forecasts indicate that close to average snowmelt volume runoff should be expected from most British Columbia rivers this coming spring and summer.

A light March precipitation and the above normal temperatures which occurred in the first half of the month have resulted in depletion of the low level snowpack. This has resulted in near average snow cover at lower elevations in most regions of British Columbia. Exceptions are the Columbia and Kootenay watersheds where April 1 readings show low level snow to be above average. The higher elevation snowpacks are average in all parts of the Province.

MONTANA

West of the Divide April 1, 1965 snow cover is relatively high, from 110 to 130 percent above both 1964 and average. The range is from slightly above average on the Kootenai and lower Clark Fork watersheds to about 135 percent on the headwaters of the Clark Fork and Blackfoot rivers. Runoff in the Kootenai is forecast at slightly above average with the remaining Columbia Basin streams forecast within the high 15 percent of the years of record. Little damage from high water is expected if the precipitation pattern and temperature sequences during the snowmelt season are near normal. Most reservoirs are being lowered to help control peak flows should it be necessary.

Late season water supplies should be good for irrigated areas because of the heavy snowpack at high elevations.

IDAHO

The water supply outlook for Idaho is for above normal flows throughout the entire state, with possibilities of record high flows on such rivers as the Big Lost and Little Wood. Snowfall during March was variable with storms near the end of the month and the first of April bringing many courses up near their normal increase for the month. Many snow courses throughout the southern half of the state have the highest snow water ever recorded since 1936. High volume flows are forecast for the Boise, Payette, Big and Little Wood, Big Lost and Salmon rivers. Streamflow during March continued well above normal with reservoirs being lowered to help control the high flows forecast for 1965. Farming operations on streams usually short of water are preparing for the excellent water supply forecast this year.

OREGON

Average to excellent water supplies for irrigation in Oregon are in prospect for 1965. The past two months of relative drouth has lowered streamflow forecasts from those of mid-winter. Heavy precipitation during December and January provided the bulk of the seasonal snow accumulation. Soils are wet under the snowpack.

Reservoir storage for conservation purposes is 130 percent of average and 150 percent of that on this date in 1964. Most streamflow forecasts are for near average flow in the western half of the state and up to 125 percent of average on the John Day and adjacant drainages in east central Oregon.

Streamflow during March has been low because of cool temperatures and a general lack of precipitation.

WASHINGTON

The water supply outlook for irrigation and power in Washington and the tributary streams of the Columbia Basin is still considered good for this time of year. There has been a definite deterioration of the snowpack during the last two months because of the absence of precipitation either in the form of rain or snow. In comparing this situation to last year, March precipitation in 1964 was high while in the early winter months precipitation tended to be deficient. This was a complete reversal of what has happened this year. The snowpack now ranges from a high of 116 percent to a low of 71 percent as compared to the average for 1948-62. Reservoirs generally have less than normal amounts of water in storage with the exception of Lake Chelan, Lake Cle Elum and Rimrock; but all reservoirs will comfortably fill with the spring runoff.

WYOMING

Seasonal snowfall on the upper Snake watershed in Wyoming is well above average as a result of winter storms that occurred all over the Pacific Northwest. Forecast for the Snake and its tributaries in this area for the April-September 1965 period is for about 125 percent of average flow.

CALIFORNIA

The California Department of Water Resources, coordinating agency for snow surveys and water supply forecasts in California, reports that as of April 1, water conditions in California are such as to ensure normal water supplies in all those areas north of the Tehachapi Mountains. Despite well below normal precipitation throughout the State since the latter part of January, the December and January storms resulted in sufficient storage in mountain snowpack and surface reservoirs to guarantee the State users normal water supplies during the coming irrigation season. In southern California, storms during March, although well below the normal expectancy, provided some improvements in the water conditions for the area over that previously experienced. Especially of note in the southern areas was the effect of the last storm of March which continued into April, bringing amounts of precipitation ranging over 200 percent of the April average.

Somewhat duplicating last month's weather pattern, California experienced only three mild storms during March. While their overall contribution amounted to only 45 percent of the normal expectancy during March, their effect was beneficial in keeping the temperatures near normal.

The precipitation distribution in California during March ranged from a low of 50 percent of normal in the North Coastal area to 80 percent of normal in the Central Coastal area. In the Central Valley, Sierra drainages received about 50 percent of their normal March precipitation, with exception of the Pit River Basin in the north and the Kern River Basin in the south, which were 20 percent and 75 percent, respectively. Although California has received only negligible amounts of rainfall since the middle of January, statewide precipitation remains above normal for the water year. Again reflecting the pattern of the early-year storms, the distribution of season-to-date rainfall ranged from 120 percent of normal in the North Coastal area to 50 percent of normal in the areas south of the Tehachapi Mountains. In the Central Valley, individual Sierra drainages are all normal or above for the period to date, with the drainages in the Central Sierra at 140 percent of normal and those in the extreme north and south at 110 and 100 percent of normal, respectively.

Runoff of California streams followed the same pattern established in February, remaining relatively high in those areas where snowpack is the main contributor of stream runoff. As a result of this unseasonable early snowmelt from the lower elevations, runoff from Central Valley streams averaged 70 percent of normal for the month. As would be expected, the range in individual river basin runoff varied in direct proportion to their snowpack, varying from 95 percent of normal for inflow to Millerton Reservoir in the San Joaquin River Basin to 41 percent of normal for inflow into Success in the Tule River Basin.

Forecasts of runoff in the Sacramento Valley for the April 1 - July 31 period, based upon April 1 snowpack and assuming normal precipitation during the remainder of the season, ranged from 116 percent of normal for the inflow to Pardee Reservoir, in the Mokelumne River Basin, to 82 percent of normal for the Yuba River at Smartville, while the inflow to Shasta Reservoir is forecasted for 92 percent of normal. In the San Joaquin Valley, forecasts ranged from 107 percent of normal for inflow to Melones Reservoir in the Stanislaus River Basin, to 71 percent of normal for inflow to Success Reservoir in the Tule River Basin.

Measurements of snowpack were made at 288 snow courses throughout the State on or about April 1. With snowpack water content for the State at 95 percent of normal, the snowpack in the Central Sierra remains above average, with less than average on the Upper Sacramento and southern San Joaquin Valley watersheds. The elevation of effective snow line on April 1 was about 4,500 feet in the Cascades of northern California and from 5,000 to 6,000 feet in the Sierra watersheds.

Based on April 1 data for 119 reservoirs with a combined usable capacity of 22,200,000 acre-feet, storage in California reservoirs is slightly above normal for this date. Water storage in these reservoirs is now up 1,450,000 acre-feet over that of one year ago.

EXPLANATION of STREAMFLOW FORECASTS

1/ Observed flow adjusted for change in storage in Hebgen Lake. 2/ Observed flow adjusted for change in storage in Canyon Ferry and Tiber reservoirs. 3/ Observed flow adjusted for change in storage in Canyon Ferry, Tiber, Fort Peck, Buffalo Bill, and Boysen reservoirs. 4/ Observed flow adjusted for change in storage in Buffalo Bill Reservoir plus Heart Mt. Diversion. 5/ Observed flow minus diversion through Jones Pass Tunnel.

6/ Observed flow minus diversions from North Platte, Colorado, and Laramie rivers plus measured diversions for irrigation and municipal use above station. 7/ Observed flow adjusted for change in storage in Clear Creek, Twin Lakes, and Sugar Loaf reservoirs minus trans-mountain diversions through Busk-Ivanhoe and Twin Lakes tunnels and Ewing, Fremont, Wurtz, and Columbine ditches. 8/ Observed flow adjusted for change in storage in Santa Maria, Rio Grande, and Continental reservoirs. 9/ Observed flow adjusted for changes in storage in reservoirs listed in (8) plus Terrace, Sanchez, Platoro, and El Vado reservoirs. 10/ Observed flow adjusted for changes in storage in Granby Reservoir plus diversions through Adams Tunnel and Grand River Ditch.

11/ Observed flow adjusted for changes in storage in Flaming Gorge, Navajo, and Lake Powell. 12/ Observed flow plus diversion through Duchesne Tunnel. 13/ Observed flow adjusted for changes in storage in Flaming Gorge and Big Sandy reservoirs. 14/ Observed flow adjusted for change in storage in Scofield Reservoir. 15/ Observed flow adjusted for change in storage in Navajo Reservoir.

16/ Observed flow. 17/ Observed flow plus Utah Power and Light Tailrace and Logan, Hyde Park, and Smithfield canals. 18/ Record computed by Bureau of Reclamation. 19/ Observed flow adjusted for change in storage in Deer Creek Reservoir, minus diversions through Duchesne Tunnel and Weber-Provo Canal, plus diversion through Salt Lake Aqueduct. 20/ Observed flow.

21/ Observed flow exclusive of Lake Tahoe and adjusted for change in storage in Boca Reservoir. Forecast by Truckee Basin Water Committee. 22/ Observed flow adjusted for change in storage in Lake Chelan. 23/ Observed flow adjusted for change in storage in Flathead and Hungry Horse reservoirs. 24/ Observed flow adjusted for change in storage in any or all of the following reservoirs above the station: Kootenay, Hungry Horse, Flathead, Pend Oreille, Coeur d'Alene, F. D. Roosevelt, Lake Chelan, Noxon, and Brownlee; and pumping from F.D.R. Lake. 25/ Observed flow adjusted for change in storage in Coeur d'Alene Lake plus diversions to Spokane Valley Farms and Rathdrum Prairie canals.

26/ Observed flow adjusted for change in storage in Mackay Reservoir plus diversion in Sharp Ditch. 27/ Combined flow of Big Wood near Belleview and Camas Creek near Blaine. 28/ Observed flow adjusted for changes in storage in Lucky Peak, Anderson Ranch, and Arrowrock reservoirs. 29/ Observed flow adjusted for changes in storage in Cascade and Deadwood reservoirs. 30/ Observed flow adjusted for changes in storage in Palisades and Jackson reservoirs.

31/ Observed flow adjusted for changes in storage in Crane Prairie, Wickiup, and Crescent Lake reservoirs. 32/ Adjusted to natural flow. 33/ Observed flow adjusted for changes in storage in Lookout Point, Detroit, Cottage Grove, Dorena, and Hills Creek reservoirs. 34/ Observed flow adjusted for changes in storage in Keechelus, Kachess, Cle Elum, Bumping, and Tieton reservoirs, plus diversions by Rosa, New Reservation, Old Reservation, and Sunnyside canals. 35/ Flow records provided by PP&L and USBR.

36/ All forecasts are for unimpaired streamflow except Kaweah River. 37/ Not corrected for upstream impairments. All other forecasts are for observed flow.

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